

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

1996-97 DRIVE AXLES

"T" Series Front Axle

AXLE RATIO & IDENTIFICATION

Front axle identification is located on tag attached near axle tube.

DESCRIPTION & OPERATION

Front axle assembly on "T" Series models uses a 7 1/4" ring gear. Front axle assembly has an electric 4WD engage/disengage feature which allows shifting in or out of 4WD while vehicle is moving (under most conditions). The 4WD feature is shifted by a vacuum actuation system. See **Fig. 1** .

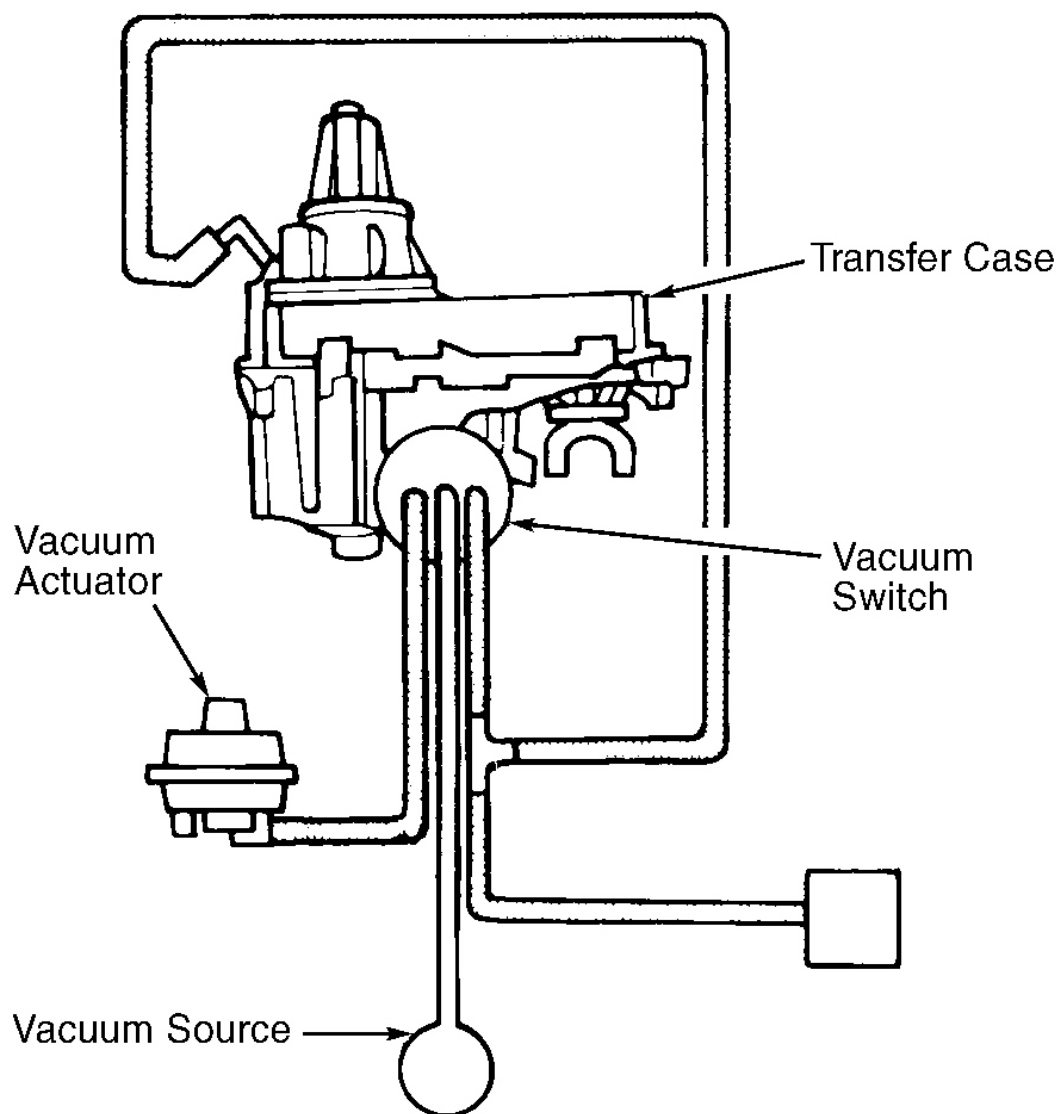
The vacuum actuation system consists of a vacuum switch and vacuum actuator. Shift mechanism in transfer case triggers vacuum switch to apply engine vacuum to vacuum actuator after about a 3-second delay. The vacuum actuator, in turn, pulls on shift cable which pulls on shift fork in axle. This connects the right axle output shaft to the front axle differential. Torque is now available to front wheels.

Right side of axle assembly consists of a solid axle shaft which rides inside of a stationary axle tube. A short stub shaft with CV joint attached is bolted to right inner axle shaft flange. Left drive axle shaft consists of a flexible drive shaft using an inner tripod joint and outer CV joint. Left axle tripod joint housing is bolted to axle carrier output shaft drive flange. CV joint splined/threaded shaft on outer end of drive axle shaft slips through steering knuckle/hub assembly. See **Fig. 3** .

Front axle assembly differential uses a conventional ring and pinion gear set to transmit driving force of engine to the front wheels. Ring and pinion gear set transfers driving force at a 90-degree angle from front drive shaft to drive axle shafts/CV joints.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle



95E27080

Fig. 1: Vacuum Actuation System

Courtesy of GENERAL MOTORS CORP.

LUBRICATION

Fill differential with 80W or 80W-90 GL-5 gear lubricant to edge of filler hole (warm differential), or to 1/2" (12 mm) below edge of filler hole (cold differential).

TROUBLE SHOOTING

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

NOTE: See **TROUBLE SHOOTING - BASIC PROCEDURES** article in **GENERAL INFORMATION**.

REMOVAL & INSTALLATION

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

CARRIER CASE MOUNTING BUSHINGS

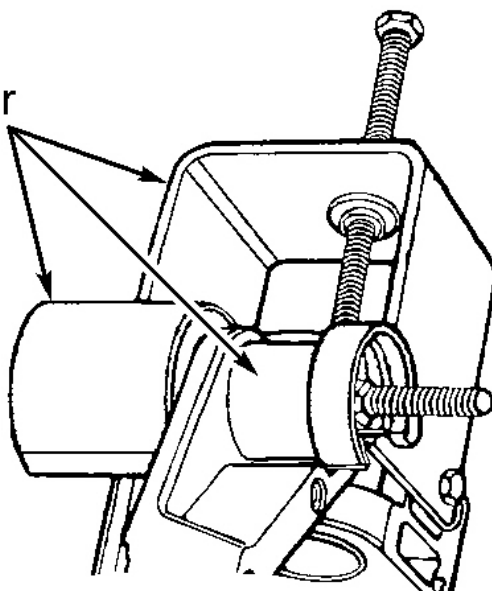
Removal & Installation

Remove front axle assembly. See **FRONT AXLE ASSEMBLY** . Using Carrier Bushing Remover/Installer (J-33791), press bushing out of carrier housing. See **Fig. 2** . To install, reverse tool and press NEW bushing into housing. Repeat procedure for other mounting bushing.

1997 Chevrolet S10 Pickup

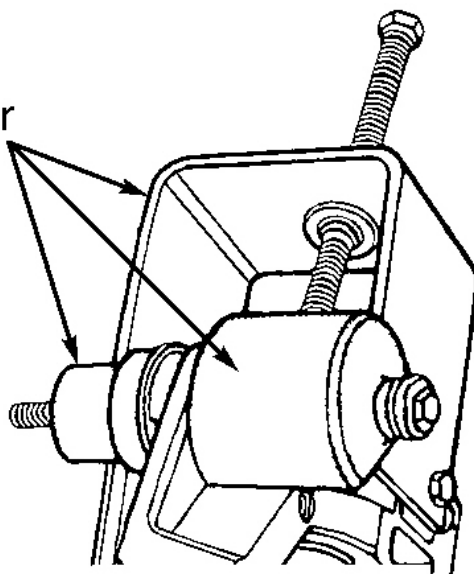
1996-97 DRIVE AXLES "T" Series Front Axle

Carrier Bushing
Remover/Installer



REMOVAL

Carrier Bushing
Remover/Installer



INSTALLATION

G92C22279

Fig. 2: Removing/Installing Carrier Case Bushing
Courtesy of GENERAL MOTORS CORP.

FRONT AXLE ASSEMBLY

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

Removal & Installation

1. Disconnect negative battery cable. Remove shift cable from vacuum actuator by disengaging lock spring. Push in actuator diaphragm to release cable.
2. Unlock steering wheel. Raise and support vehicle. Remove engine drive belt shield and front axle skid plate (if equipped). Remove wheels. Remove lower shock absorber bolt, and compress shock to gain access to output shaft flange bolts.
3. Disconnect 4WD indicator light connector from switch. Remove 3 bolts securing cable and switch housing. Pull housing away to gain access to cable locking spring. DO NOT unscrew cable coupling nut unless cable is being replaced. See **SHIFT CABLE** .
4. Disconnect shift cable from shift fork shaft by lifting spring over slot in shift fork. Disconnect axle vent hose. Disconnect steering relay rod from idler arm and pitman arm, and pull steering linkage forward. Support axle assembly using appropriate transmission jack.
5. Remove 6 right stub shaft-to-output shaft flange bolts, and 6 left drive axle-to-output shaft flange bolts. Wire left drive axle and right stub shaft aside. Mark front of drive shaft to ensure proper installation. Remove bolts and clamps. Wire drive shaft aside.
6. Remove bolts securing right axle tube to frame rail. Remove mounting bolts from axle assembly. Tip axle assembly counterclockwise while lifting to gain clearance from mounting ears and remove axle assembly. To install, reverse removal procedure. Tighten all bolts and nuts to specification. See **TORQUE SPECIFICATIONS** .

LEFT DRIVE AXLE SHAFT

Removal

1. Raise and support vehicle. Remove engine drive belt shield and front axle skid plate (if equipped). Remove wheel. Remove stabilizer bar from lower control arm. If both ends of stabilizer bar are being removed, DO NOT mix left and right stabilizer bar components.

CAUTION: DO NOT use wedge type remover tool on tie rod end. Damage to tie rod end will result.

2. Disconnect left outer tie rod end from steering knuckle using Steering Linkage Puller (J-24319-01). Wire tie rod end aside. Insert a long drift through caliper and into disc rotor vanes to prevent rotation. Remove cotter pin, retainer, axle hub nut and washer from drive axle shaft CV joint. See **Fig. 3** . Loosen 6 drive axle shaft flange bolts retaining tripod joint housing to axle carrier output shaft drive flange.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

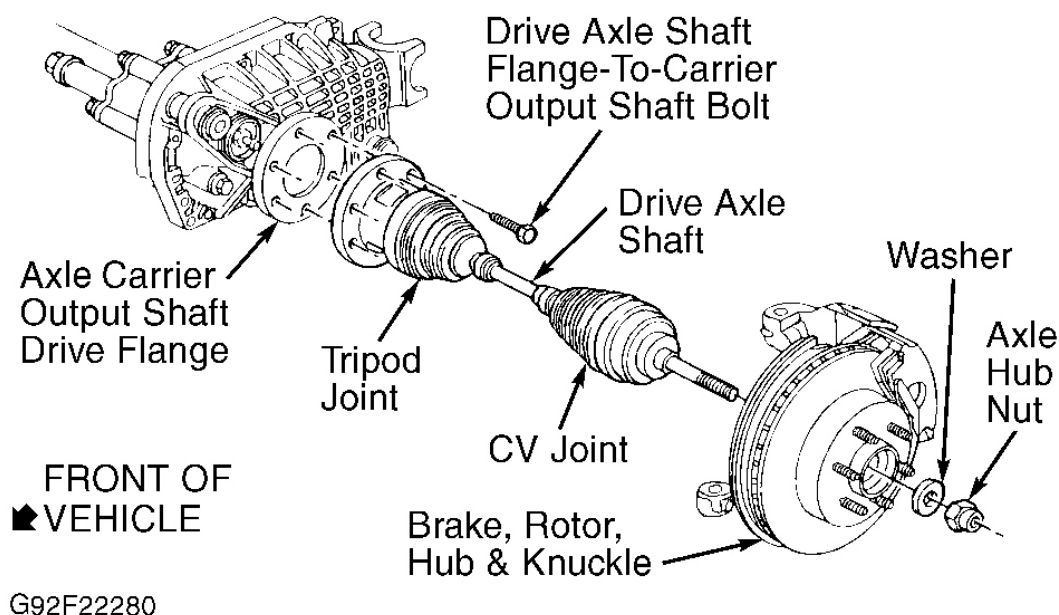


Fig. 3: Left Drive Axle Shaft With Tripod & CV Joints
Courtesy of GENERAL MOTORS CORP.

3. Remove brakeline bracket from upper control arm. Remove shock absorber from lower control arm mounting bracket. Install floor stand or jack under lower control arm near ball joint to maintain spring tension and lower control arm position.
4. Remove upper control arm ball joint-to-steering knuckle nut. Separate upper control arm ball joint stud from knuckle. Using shop towel, cover lower shock mount ears on lower control arm to prevent CV joint boot damage when removing axle shaft. Install Puller (J-28733) to rotor to push CV joint splined shaft through hub splines.
5. Remove 6 drive axle shaft flange bolts securing tripod joint housing to axle carrier output shaft drive flange. DO NOT allow drive axle shaft to hang free. Pull slightly outward on top of steering knuckle to enable drive axle shaft removal. DO NOT stretch brake hose. Remove drive axle shaft.

Installation

1. Before installing drive axle shaft, inspect inner wheel bearing seal on rear of knuckle. Replace, if required, using Seal Installer (J-28574). Lube seal lip.
2. To install drive axle shaft, reverse removal procedure. Tighten all bolts and nuts to specification. See **TORQUE SPECIFICATIONS**.

PINION FLANGE & OIL SEAL

Removal

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

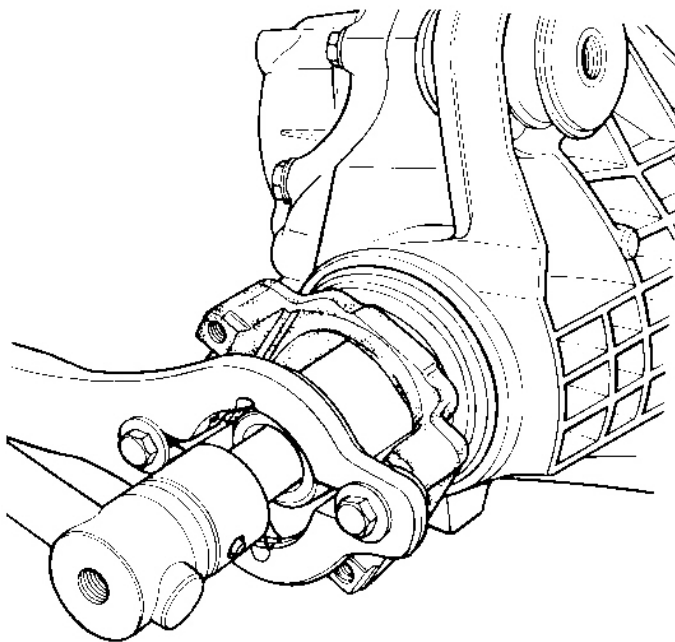
1. Remove bolts and retainers from pinion flange. Mark position of drive shaft to pinion flange to ensure correct installation. Remove drive shaft from pinion flange, and wire shaft aside.
2. Mark pinion flange, pinion shaft and pinion nut to ensure alignment and bearing preload are maintained on installation. Using Pinion Flange Remover Set (J-8614-01), hold pinion flange stationary and remove pinion flange nut and washer. Place drain pan under pinion area of differential carrier. Remove pinion flange and oil seal. See **Fig. 4**.
3. Clean pinion flange in solvent and inspect seal surface of pinion flange for nicks, burrs or damage (such as a groove worn into pinion flange by oil seal). Repair or replace as necessary.

Installation

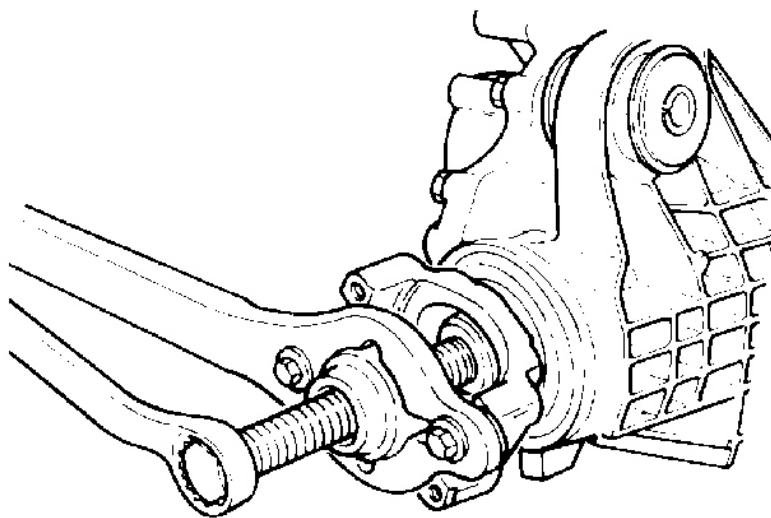
1. Lubricate pinion flange surface and sealing lip of oil seal. Install oil seal using seal installer. Install pinion flange onto pinion shaft with marks aligned. Install pinion nut and tighten to position marked on pinion shaft.
2. Tighten nut 1/16" beyond alignment marks. Install drive shaft and tighten bolts to specification. See **TORQUE SPECIFICATIONS**. Check gear oil level.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle



PINION NUT REMOVAL



PINION FLANGE REMOVAL

G90F15243

Fig. 4: Removing Pinion Nut & Flange
Courtesy of GENERAL MOTORS CORP.

RIGHT AXLE TUBE & INNER AXLE SHAFT

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

Removal

1. Disconnect negative battery cable. Remove shift cable from vacuum actuator by disengaging lock spring. Push in actuator diaphragm to release cable.
2. Unlock steering wheel. Raise and support vehicle. Remove engine drive belt shield and front axle skid plate (if equipped). Remove wheel. Remove stabilizer bar from both lower control arms. DO NOT mix left and right stabilizer bar components.
3. Place a support under right lower control arm, and disconnect right upper ball joint. Remove support so control arm can hang free. Remove stub axle shaft flange bolts from inner axle shaft flange.
4. Disconnect 4WD indicator light connector from switch. Remove 3 bolts securing cable and switch housing. Pull housing away to gain access to cable locking spring. DO NOT unscrew cable coupling nut unless cable is being replaced. See **SHIFT CABLE**.
5. Disconnect shift cable from shift fork shaft by lifting spring over slot in shift fork. Place drain pan under drive axle. Remove drain plug to drain lubricant. Remove bolts securing axle tube to right frame. Remove bolts securing axle tube assembly to carrier.
6. Remove tube assembly by working around drive axle. DO NOT allow sleeve, thrust washers, connector and output shaft to fall out of carrier while removing tube. See **Fig. 5**.

Installation

1. Install sleeve, thrust washers, connector and output shaft in carrier. Apply Sealant (GM 1052942 or Loctite 518) on axle tube to differential surface. Ensure thrust washer is installed with notch aligned with tab on washer. See **Fig. 6**. Use wheel bearing grease to hold thrust washer in place.
2. Install tube and shaft assembly to differential and install one bolt at one o'clock position, but DO NOT tighten. Pull assembly down and install cable, switch housing and 4 remaining bolts. Tighten bolts to specification. See **TORQUE SPECIFICATIONS**.
3. Install 2 bolts securing tube to frame. Tighten bolts to specification. See **TORQUE SPECIFICATIONS**. Inspect shift mechanism operation. To complete installation, reverse removal procedure.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

1. Axle Shaft (Inner)

2. Deflector

3. Seal

4. Bearing

5. Tube

6. Bolt

7. Washer

8. Ring

9. Connector

10. Cable

11. Housing

12. Gasket

13. Switch

14. Spring

15. Seal

16. Spring

17. Shaft

18. Bolt

19. Lock

20. Washer

21. Bearing

22. Sleeve

23. Shaft

24. Washer

25. Plug

26. Washer

27. Pin

28. Bolt

29. Axle Housing

30. Bearing

31. Insert

32. Sleeve

33. Bearing

34. Bolt

35. Differential Housing

36. Screw

37. Ring & Pinion Gears

38. Shim Kit

39. Bearing

40. Spacer

41. Bearing

42. Seal

43. Deflector

44. Flange

45. Washer

46. Nut

47. Plug

48. Bushing

49. Housing

50. Ventilator

51. Connector

52. Shaft

53. Washer

54. Gear

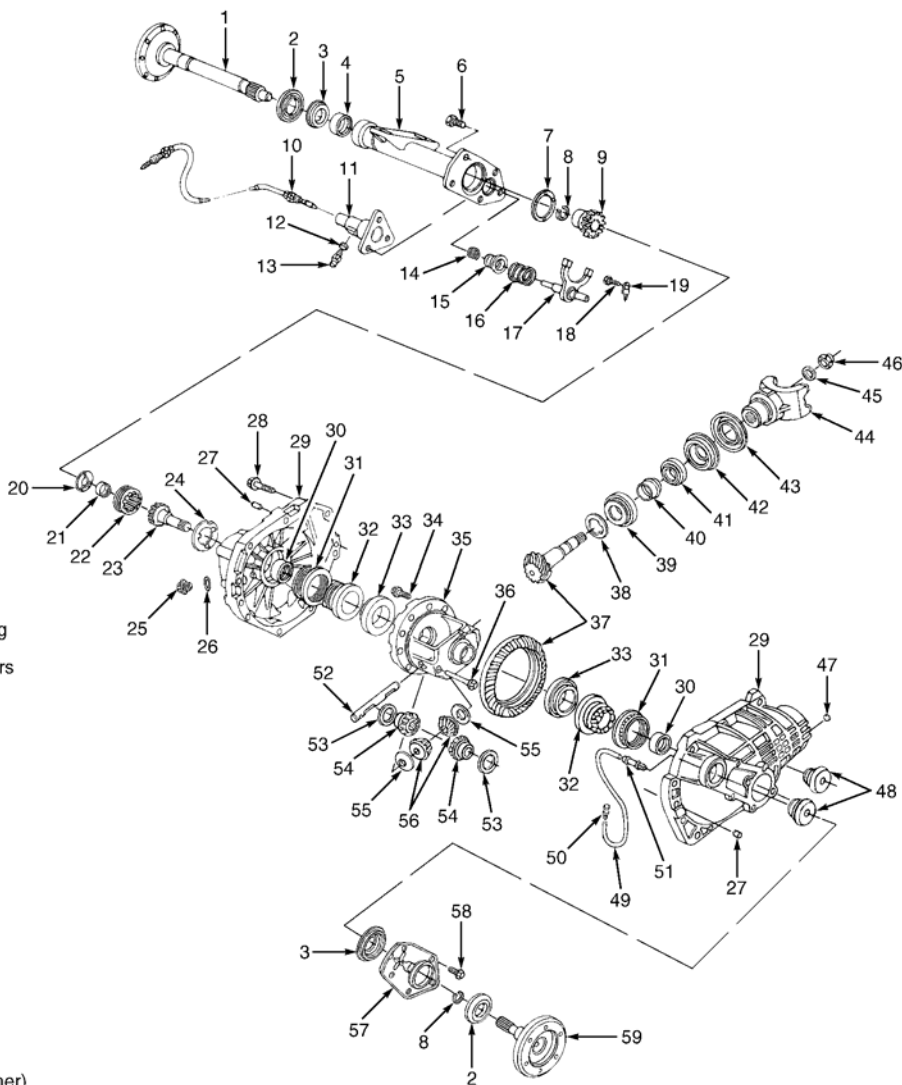
55. Washer

56. Gear

57. Cover

58. Bolt

59. Left Axle Shaft (Inner)



95F27081

Fig. 5: Exploded View Of 4WD "T" Series Front Axle Assembly
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

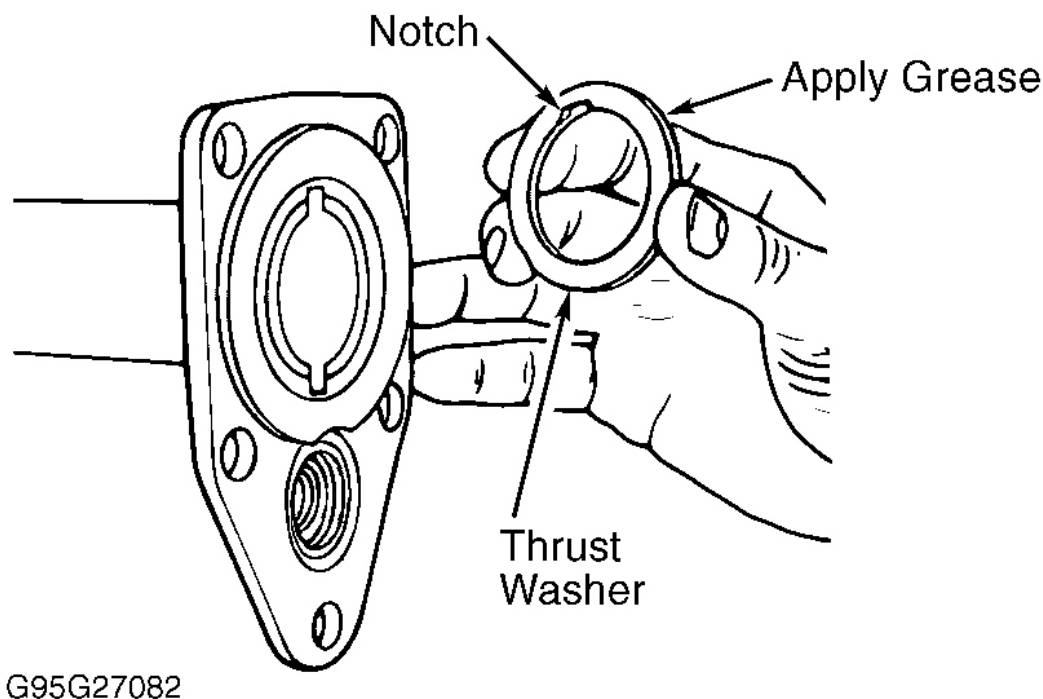


Fig. 6: Installing Axle Tube Thrust Washer
Courtesy of GENERAL MOTORS CORP.

RIGHT SIDE OUTPUT SHAFT PILOT BEARING

Removal & Installation

Remove right axle tube and inner axle shaft assembly. See **RIGHT AXLE TUBE & INNER AXLE SHAFT** . Remove pilot bearing using Pilot Bearing Remover (J-34011). Lubricate NEW pilot bearing with wheel bearing grease. Install NEW pilot bearing using Pilot Bearing Installer (J-33842). To complete installation, reverse removal procedure.

SHIFT CABLE

Removal

1. Disengage shift cable from vacuum actuator by disengaging locking spring. Push actuator diaphragm in to release cable. Squeeze 2 locking fingers of cable with pliers. Pull cable out of bracket hole.
2. Raise and support vehicle. Remove bolts securing cable and switch housing to carrier. DO NOT unscrew coupling nut at this time. Remove shift cable housing from carrier assembly. Pull out about 3/4" (19 mm) of cable. Remove cable end from shift fork shaft. Bend tang of lock spring, then pull cable end from shift fork shaft.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

3. Note cable routing for installation. Unscrew coupler nut and remove shift cable from shift cable housing. Remove cable from vehicle.

Installation

1. Install cable and switch housing to carrier. Tighten mounting bolts to specification. See **TORQUE SPECIFICATIONS** .
2. Guide cable through switch housing into fork shaft hole and push cable in. Cable will snap into place. Start coupling nut by hand to avoid cross threading. Tighten nut to specification. See **TORQUE SPECIFICATIONS** . DO NOT overtighten nut.
3. Connect shift cable to vacuum actuator by pressing cable into bracket hole. Cable and housing will snap into place. Check cable operation.

VACUUM ACTUATOR

Removal & Installation

Disconnect vacuum line from actuator. Remove shift cable. See **SHIFT CABLE** . Remove vacuum actuator bolts and actuator. To install, reverse removal procedure.

OVERHAUL

RIGHT AXLE TUBE ASSEMBLY

Disassembly

1. Place mounting flange of axle tube assembly in a vise. Remove springs, shift shaft/fork, and differential sleeve (No. 22). See **Fig. 5** . Remove snap ring, connector gear and thrust washer from axle shaft.
2. Using a soft mallet, tap on flange end of axle shaft to remove axle shaft from tube. DO NOT hammer on pilot bearing stem end of axle shaft, severe damage will result. Using a screwdriver, pry out deflector and oil seal.
3. Using a Bearing Remover (J-29369-2) and slide hammer, remove axle bearing from tube.

Cleaning & Inspection

Wash all parts in solvent. Dry using compressed air. Inspect all parts for excessive wear and scoring. Inspect connector gear and axle shaft splines for wear, cracks, and twisted splines.

Reassembly

1. Clean gasket surfaces on axle tube and carrier housing. Lubricate NEW bearing using wheel bearing grease. Using Bearing Installer (J-33844), install axle bearing into tube. Lightly coat lip of NEW seal with grease. Install seal using Seal Installer (J-33893).
2. Install deflector to axle shaft (if removed) and insert axle shaft into axle tube. Install thrust washer, ensuring tube slots align with tabs on washer. See **Fig. 6** . Use wheel bearing grease to hold thrust washer in place.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

3. Drive connector gear onto end of axle using a plastic hammer. Install snap ring. Ensure snap ring seats properly in groove. Ensure axle tube and carrier case sealing surfaces are clean. Install springs on shift shaft/fork. Insert shift shaft/fork into groove in differential sleeve. Install shift shaft/fork assembly into tube assembly at same time sleeve is installed onto connector gear.
4. Apply a bead of Sealant (GM 1052942 or Loctite 518) to axle tube sealing surface. Assemble axle tube to carrier case. Install and tighten axle tube-to-carrier bolts to specification. See **TORQUE SPECIFICATIONS** . Inspect shift mechanism operation.

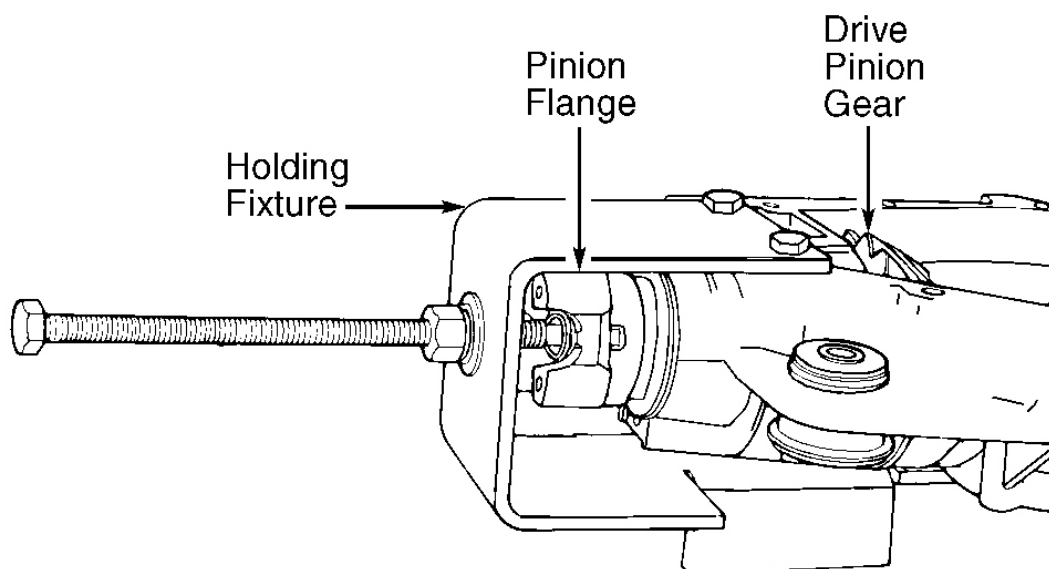
FRONT AXLE ASSEMBLY

Disassembly

1. Remove axle carrier. See FRONT AXLE ASSEMBLY under **REMOVAL & INSTALLATION** . Remove right axle tube and inner axle shaft assembly. See **RIGHT AXLE TUBE & INNER AXLE SHAFT** under REMOVAL & INSTALLATION.
2. Remove shift shaft/fork assembly consisting of sleeve, springs and seals. See **Fig. 5** . Remove thrust washer and output shaft from right side of carrier assembly. Remove right output shaft bearing using Bearing Remover (J-34011). Remove washer from right side of carrier assembly.
3. Remove left output flange from carrier assembly by prying on one side with a screwdriver while simultaneously tapping outward on other side with a soft-faced hammer. Remove deflector from output flange. Remove 6 cover-to-carrier bolts securing left side cover. Tap cover to loosen and remove. Pry out left output flange seal with a screwdriver.
4. Remove 10 bolts holding carrier halves together. Insert screwdriver in slots provided (one next to fill plug, one 180 degrees from fill plug) and pry carrier halves apart. See **Fig. 12** .
5. Remove differential assembly from carrier. See **Fig. 5** . Remove both side bearing adjusting sleeve lock tabs. Using Side Bearing Adjusting Wrench (J-33792), rotate adjusting sleeve and push side bearings out of bores. Remove side bearings from adjusting sleeve using Bearing Remover (J-21551).
6. Using Pinion Flange Remover Set (J-8614-01), hold pinion flange stationary and remove pinion nut. See **Fig. 4** . Mount left half of carrier in Holding Fixture (J-33837-1). Use bolts supplied with remover set to install carrier on fixture. See **Fig. 7** . Remove pinion flange and deflector.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle



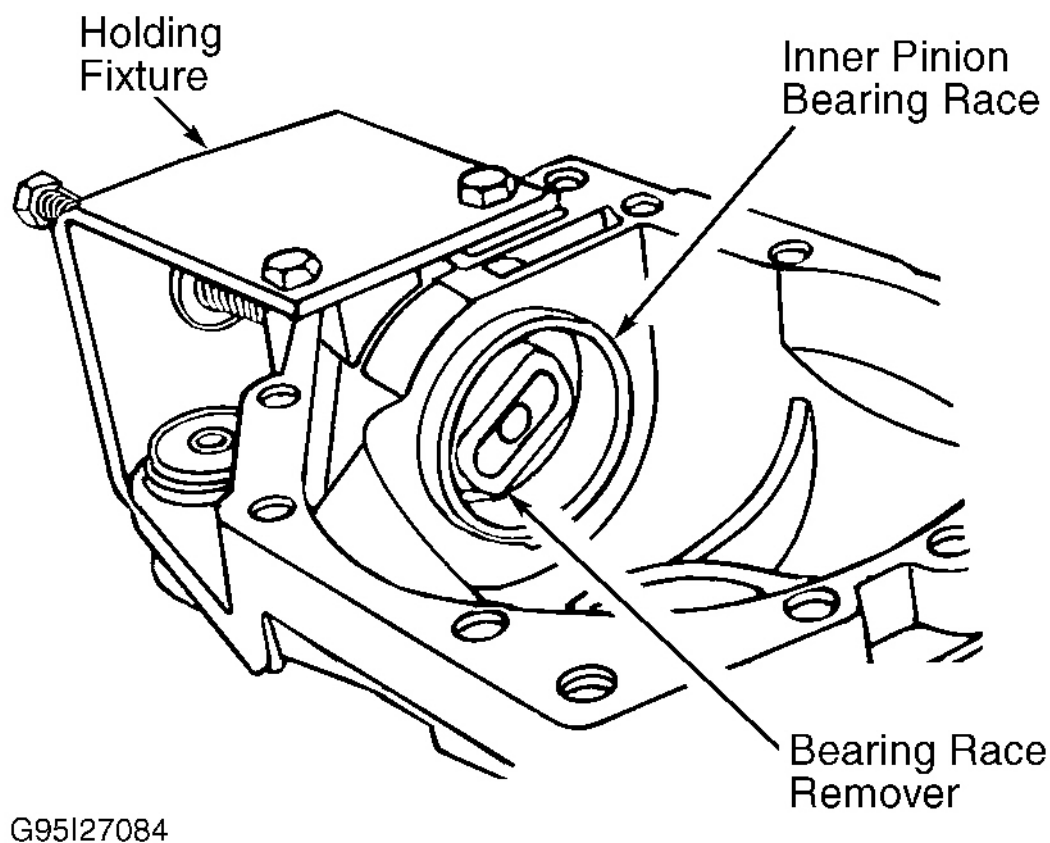
G95H27083

Fig. 7: Installing Pinion Holding Fixture Tool
Courtesy of GENERAL MOTORS CORP.

7. Remove pinion with attached shim, inner bearing and spacer as an assembly. Remove collapsible spacer from pinion. Using Differential Side/Pinion Bearing Remover (J-22912-01), press inner bearing from pinion. Remove shim(s) from pinion, keeping shims in order.
8. Install Bearing Race Remover (J-33837-6) on Holding Fixture (J-33837-1) and remove outer pinion bearing, race and pinion seal. Remove inner pinion bearing race by pushing it out of carrier with bearing race remover installed on Pinion Bearing Remover/Installer Set (J-33837). See **Fig. 8**.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle



G95I27084

Fig. 8: Removing Inner Pinion Bearing Race
Courtesy of GENERAL MOTORS CORP.

9. Using Differential Side/Pinion Bearing Remover (J-22912-01), remove side bearings from differential case assembly. Remove ring gear bolts. Ring gear uses left-hand thread bolts. Using a brass drift, drive ring gear from differential case. DO NOT pry ring gear from differential case or damage to ring gear and differential case will occur.
10. Remove bolt from differential pinion gear shaft. Remove pinion gear shaft. Roll pinion gears and thrust washers out of differential case. Remove side gears and thrust washers, marking side gears and differential case left and right for reassembly reference. Upper and lower carrier mounting bushings should be replaced using Bushing Remover (J-33791).

Cleaning & Inspection

Clean all parts in cleaning solvent. Inspect all parts for excessive wear. Replace as required.

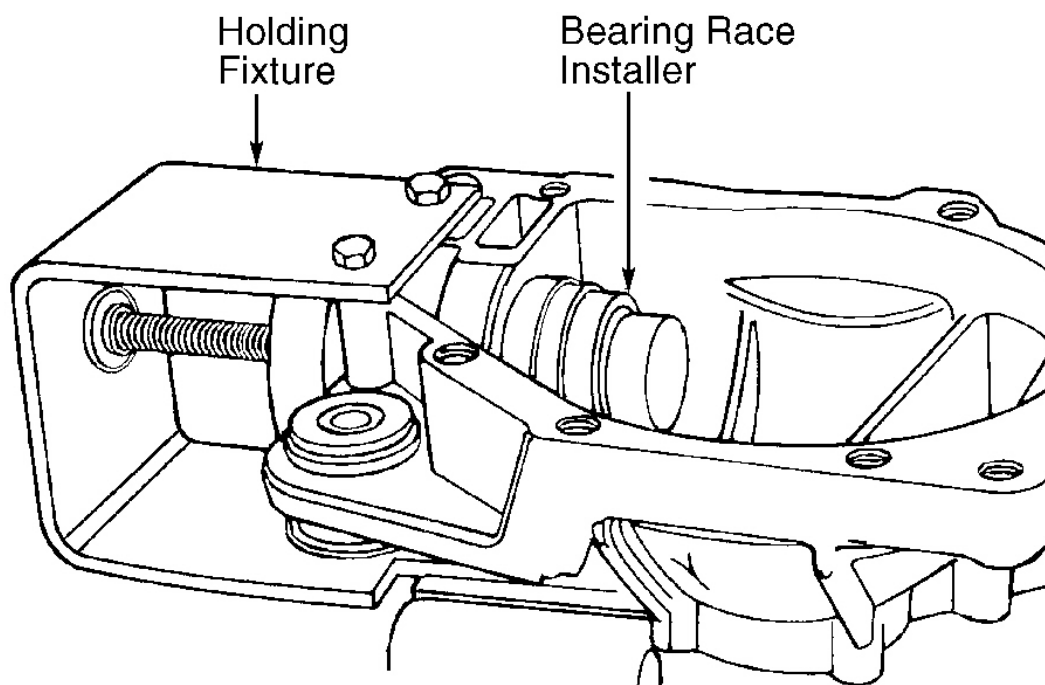
Reassembly

1. Install pinion bearing races using Holding Fixture (J-33837-1) and Bearing Race Installer (J-33837-4)

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

until races are seated in carrier. See **Fig. 9** . Lubricate inner and outer bearings, then set pinion depth. See **DRIVE PINION DEPTH** under ADJUSTMENTS.



G95J27085

Fig. 9: Installing Inner Pinion Bearing Race
Courtesy of GENERAL MOTORS CORP.

2. Install appropriately sized shim onto pinion. Shim size was previously determined during pinion depth adjustment. Using Pinion Bearing Installer (J-33785), install inner pinion bearing onto pinion. Install NEW collapsible spacer onto pinion shaft. Lubricate outer pinion bearing, and install bearing and pinion seal into carrier case using Seal Installer (J-33782). Insert pinion, with attached inner bearing and collapsible spacer, into carrier case.
3. Install deflector and pinion flange. Apply GM PST sealant to area where pinion threads meet pinion flange. Install pinion washer and nut. Install same flange holder previously used to remove pinion flange. Hold flange while slowly tightening nut and checking pinion flange until no end play is present. DO NOT tighten nut any further.
4. Rotate pinion several times to ensure bearings have been seated. Recheck end play. Set final pinion preload to 15-25 INCH lbs. (1.7-2.8 N.m) by tightening pinion nut in small increments, rotating pinion between increments. Each increment increases preload by several INCH lbs.
5. If preload specification is exceeded, remove pinion and install NEW collapsible spacer. Once preload has been obtained, rotate pinion several times to ensure bearings have seated and recheck preload.
6. Install side gears and thrust washers into differential case. If old side gears are being reinstalled, ensure they are placed in their original locations as marked during disassembly.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

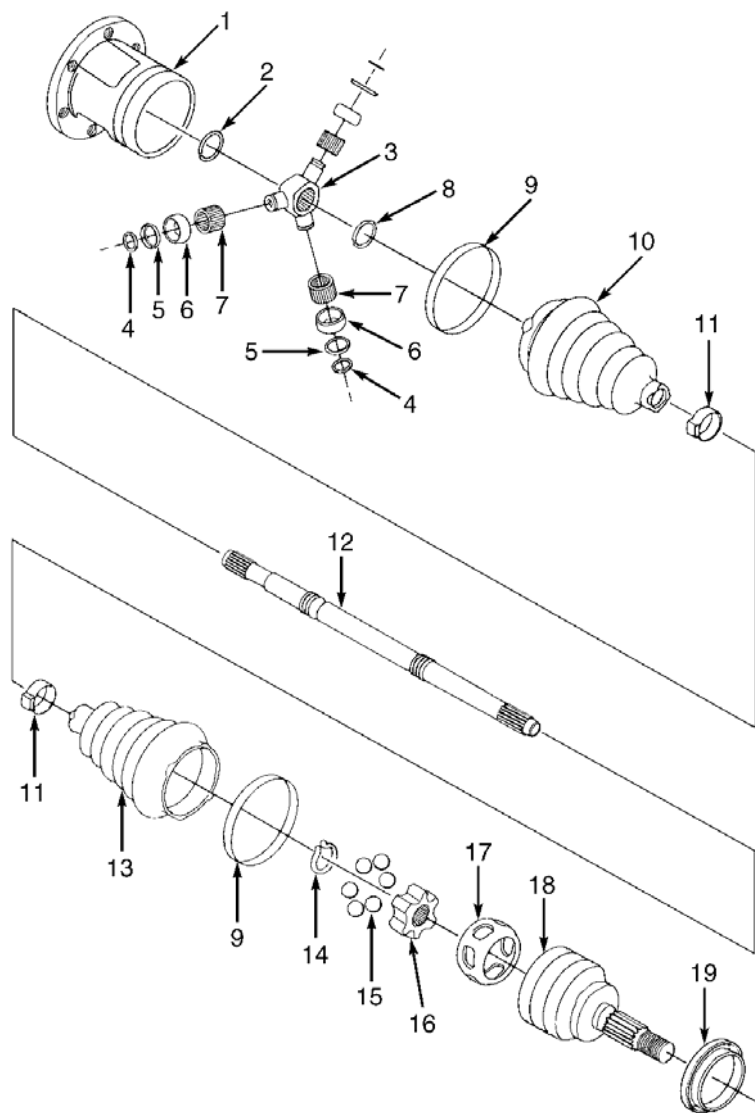
7. Position one pinion gear between side gears and rotate gears until pinion gear is directly opposite opening in case. Place remaining pinion gear between side gears. Ensure holes in both pinion gears line up. Rotate pinion gears toward opening just enough to allow installation of thrust washers.
8. Install differential pinion gear shaft. Install pinion gear shaft bolt. Install ring gear onto differential assembly. Tighten NEW bolts alternately in progressive steps to 60 ft. lbs. (81 N.m). Ring gear uses left-hand thread bolts.
9. Press side bearings onto differential assembly using Side Bearing Installer (J-33790). Press bearings onto sleeves using Bearing Installer (J-33788).
10. Using same side bearing adjusting wrench used during disassembly, install sleeves into carrier case. Install side bearing races into carrier using Race Installer (J-23423-A). Place differential assembly into left carrier case half. Turn left sleeve inward until backlash is felt between ring and pinion.
11. Remove carrier case from holding fixture, and attach carrier halves together using 4 bolts. If halves DO NOT make complete contact, back out right sleeve. Install carrier case bolts and tighten to 35 ft. lbs. (47 N.m). Set ring gear backlash adjustment to specification. See **RING GEAR BACKLASH** under ADJUSTMENTS.
12. Install both side bearing adjusting sleeve lock tabs over left and right sleeves. Remove 4 bolts holding axle carrier halves together and separate carrier halves. Apply Sealant (GM 1052942 or Loctite 518) to one carrier housing surface.
13. Reconnect axle carrier housing halves. Install 10 attaching bolts and tighten to specification. See **TORQUE SPECIFICATIONS** . Install/drive seal into left side cover. Apply Sealant (GM 1052942 or Loctite 518) to left side cover. Install 6 cover-to-carrier bolts securing left side cover and tighten to specification. See **TORQUE SPECIFICATIONS** .
14. Install deflector onto left output shaft and insert shaft into left side of carrier. Drive shaft into place with a soft-faced (brass or plastic) hammer. Install NEW pilot bearing into right output shaft using Pilot Bearing Installer (J-33842). Install washer onto right output shaft, and insert right output shaft into right side of carrier.
15. Install right axle tube and inner axle shaft assembly. See **RIGHT AXLE TUBE & INNER AXLE SHAFT** under REMOVAL & INSTALLATION. To complete reassembly, reverse disassembly procedure.

LEFT DRIVE AXLE SHAFT

NOTE: Use illustration for exploded view of left drive axle shaft. See **Fig. 10** .

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle



- | | |
|-------------------------|------------------------|
| 1. Tripot Housing | 11. Boot Ring |
| 2. Retainer Ring | 12. Axle Shaft |
| 3. Spider | 13. Dust Boot |
| 4. Needle Retainer Ring | 14. Race Retainer Ring |
| 5. Needle Retainer | 15. Ball |
| 6. Tripot Ball | 16. Inner Race |
| 7. Needle Roller | 17. Cage |
| 8. Spacer Ring | 18. Outer Race |
| 9. Boot Ring | 19. Deflector Ring |
| 10. Dust Boot | |

90H15237

Fig. 10: Exploded View Of Left Axle Shaft
Courtesy of GENERAL MOTORS CORP.

ADJUSTMENTS

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

DRIVE PINION DEPTH

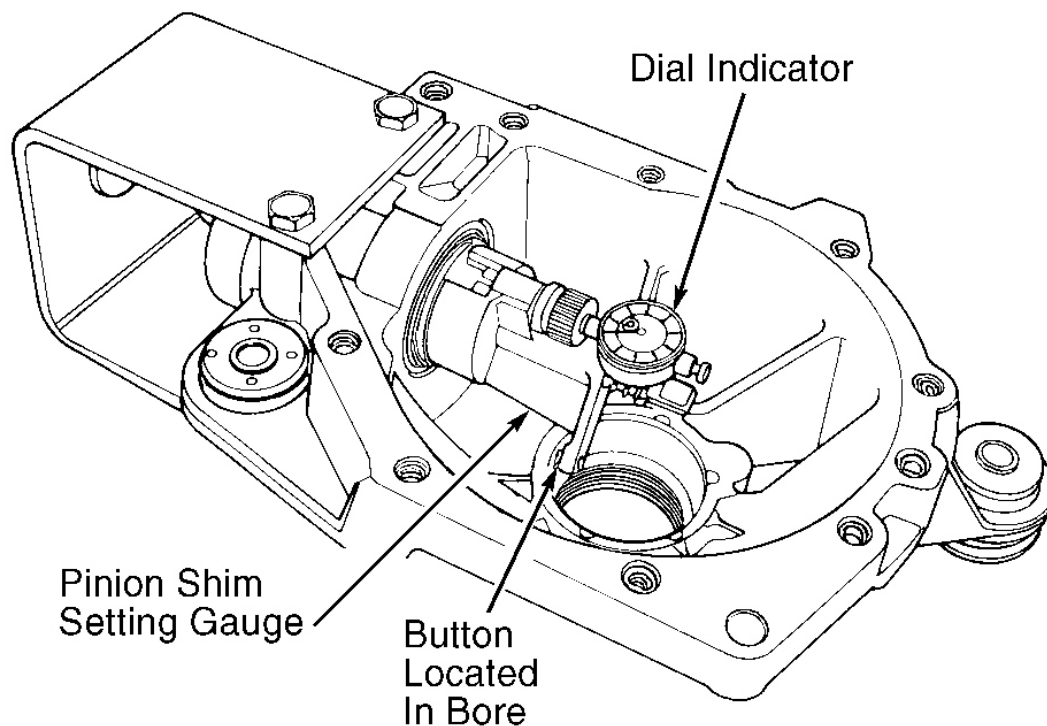
1. Lubricate inner and outer pinion bearings liberally with gear oil. Hold pinion bearings in position and install Pinion Shim Setting Gauge (J-33838). Install Dial Indicator (J-29763) onto gauge. See **Fig. 11** .
2. With gauge installed, preload inner and outer pinion bearings to 9-14 INCH lbs. (1.0-1.6 N.m) by tightening shim setting gauge mounting bolt while holding end of gauge shaft with a wrench. Rotate shaft several times to ensure bearings have seated. Recheck preload.
3. Push dial indicator downward until needle rotates about 3/4 turn clockwise. Tighten dial indicator in this position. Set button of pinion shim setting gauge on differential bearing bore. See **Fig. 11** .

NOTE: **4WD front axle drive pinion gears are nominal or zero, and are not marked on pinion head surface. Shim thickness will equal dial indicator gauge reading.**

4. Rotate gauge slowly back and forth until dial indicator reads lowest point of bore. Set dial indicator to zero. Repeat rocking action of gauge to verify zero setting.
5. After satisfactory zero setting is obtained and verified, move gauge button out of differential side bearing bore. Record dial indicator reading. Use a shim that is exactly the same size as this indicator reading.
6. Remove dial indicator and gauge from carrier. Position correct shim on drive pinion. Install drive pinion bearing. Continue at step 2) of REASSEMBLY under FRONT AXLE ASSEMBLY under **OVERHAUL** .

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle



G95A27086

Fig. 11: Pinion Shim Setting Gauge & Dial Indicator Installation & Measurement
Courtesy of GENERAL MOTORS CORP.

RING GEAR BACKLASH

1. Use Side Bearing Adjusting Wrench (J-33792) and torque wrench to tighten right adjusting sleeve until no backlash is present. This torque measurement should be about 100 ft. lbs. (136 N.m).
2. Using Side Bearing Adjusting Wrench (J-33792), tighten left adjusting sleeve until no backlash is present. This torque measurement should be about 100 ft. lbs. (136 N.m).
3. Mark location of adjusting sleeves in relation to carrier halves so notches can be counted when turned. See **Fig. 12** . Turn right sleeve OUT 2 notches using side bearing adjusting wrench. Turn left sleeve IN one notch. Rotate pinion several times to seat bearings.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

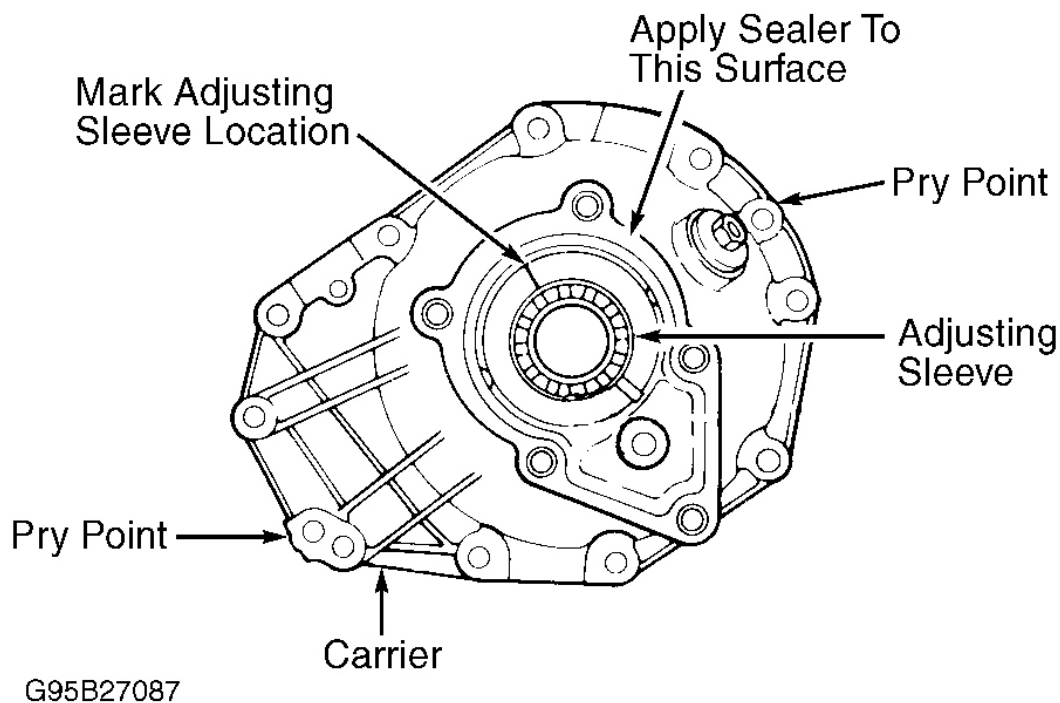


Fig. 12: Marking Adjusting Sleeve Location
Courtesy of GENERAL MOTORS CORP.

4. Mount base clamp of Dial Indicator Set (J-8001) so gauge plunger button contact outer edge of pinion flange. Ensure plunger is at right angle to flange. See **Fig. 13** . Move pinion flange through its free play travel while holding differential carrier and ring gear stationary. Record dial indicator reading. Divide dial indicator reading by 2 to obtain backlash reading.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

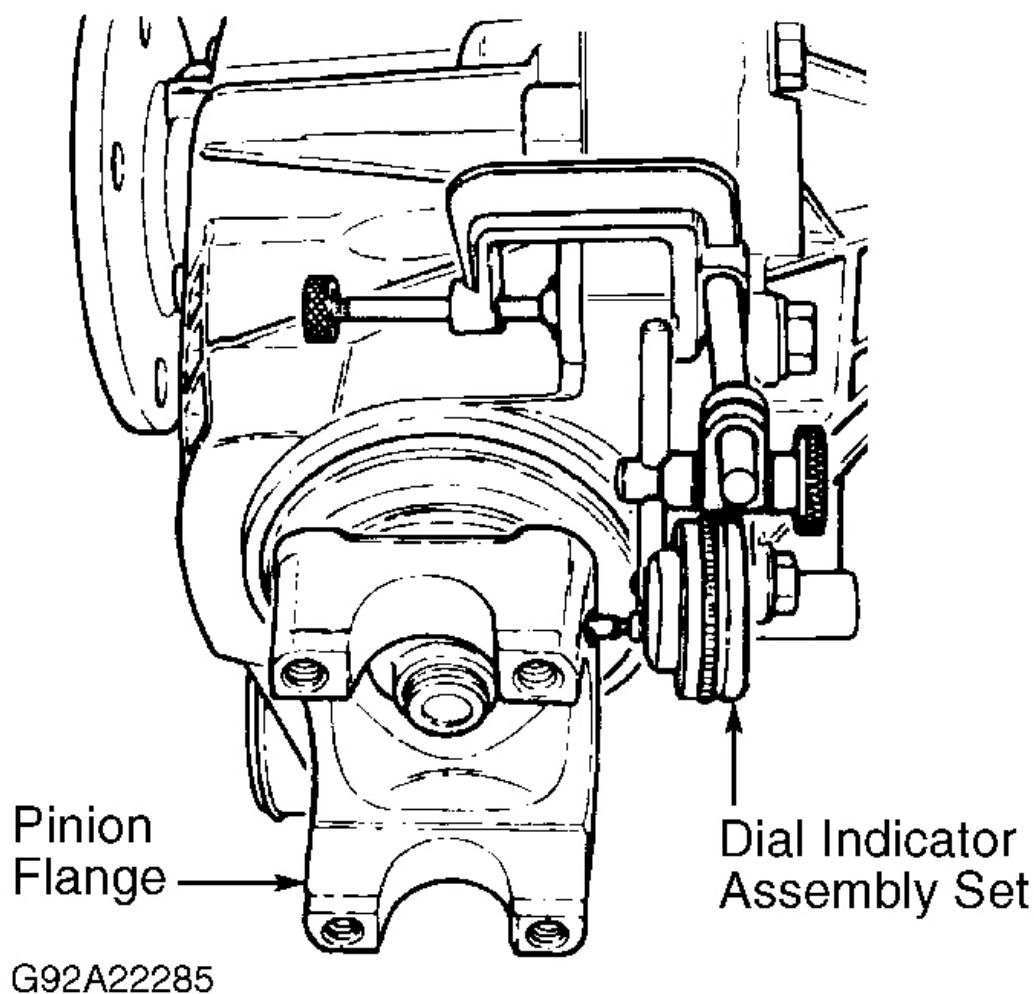


Fig. 13: Measuring Backlash At Pinion Flange
Courtesy of GENERAL MOTORS CORP.

5. Gear backlash at pinion flange should be .003-.010" (.08-.25 mm), with a preferred measurement of .005-.007" (.13-.18 mm). If backlash is not within specification, equally turn adjusting sleeves as necessary.
6. To increase backlash, turn left sleeve in and turn right sleeve out an equal amount. To decrease backlash, turn right sleeve in and turn left sleeve out an equal amount. Turning sleeve one notch will change backlash about .003" (.08 mm). DO NOT install sleeve locks yet.
7. When backlash is within specification, perform gear tooth contact pattern check. See GEAR TOOTH CONTACT PATTERNS article in GENERAL INFORMATION. When pattern is satisfactory, continue at step 12) of REASSEMBLY under FRONT AXLE ASSEMBLY under **OVERHAUL**.

AXLE ASSEMBLY SPECIFICATIONS

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle

AXLE ASSEMBLY SPECIFICATIONS

Application	In. (mm)
Ring Gear Backlash	
Preferred	.005-.007 (.13-.18 mm)
Allowed	.003-.010 (.08-.25)
Ring Gear Runout (Maximum)	.002 (.05)
	INCH Lbs. (N.m)
Pinion Bearing Preload	15-25 (1.7-2.8)

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Axle Assembly Mounting (Bushing) Bolts	66 (90)
Axle Assembly Mounting (Bushing) Nuts	55 (75)
Axle Hub Nut	181 (245)
Ball Joint Nut (Upper)	83 (113)
Cable Switch Housing Bolts	35 (48)
Carrier Case Bolts	35 (47)
Drain & Fill Plugs	24 (33)
Drive Axle/Stub Shaft-To-Output Flange Bolts	59 (80)
Front Drive Shaft Bolts	59 (80)
Idler Arm-To-Steering Relay Rod Nut	60 (82)
Left Output Shaft Cover Bolts	18 (25)
Pitman Arm-To-Steering Relay Rod Nut	35 (47)
Right Axle Tube-To-Carrier Bolts	35 (48)
Right Axle Tube-To-Frame Bolts	55 (75)
Ring Gear Bolts ⁽¹⁾	59 (80)
Shock Absorber Lower Mounting Bolt	54 (73)
Skid Plate Bolts	20 (27)
Stabilizer Bar Bushing Bracket-To-Frame Bolts	30 (40)
Stabilizer Bar-To-Lower Control Arm Bolts	24 (33)
Tie Rod Nut	35 (47)
Wheel Lug Nuts	96 (130)
	INCH Lbs. (N.m)
Adjusting Sleeve Lock Bolt	71 (8)
Shift Cable Coupling Nut	89 (10)
(1) Always use NEW bolts. Bolts are left-hand thread.	